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SOURCE Komunikacja Kolejowa w Planie 6-letnim (Railroad Transportation in
 the Six-Year Plan)

DEVELOPMENT OF RAIL TRANSPORTATION IN POLAND;
MAIN OBJECTIVES IN SIX-YEAR PLAN FOR TRANSPORTATION

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 Master of Eng

[The following report gives information on passenger and freight transportation in Poland. The information was abstracted from the monograph Komunikacja Kolejowa w Planie 6-Letnim (Railroad Transportation in the Six-Year Plan). The report outlines the over-all development of Polish railroads since the end of World War II with particular emphasis on the Three-Year Plan (1947-1949), and the main objectives of the Six-Year Plan (1950-1955) for transportation.]

RAILROAD RECONSTRUCTION FROM 1945-1949

During World War II 46 percent of all bridges, 37 percent of buildings, 43 percent of pumping facilities (pompownie), and 11,864 kilometers of tracks were destroyed in Poland.

By 31 December 1945 the Poles reconstructed, either permanently or temporarily, 47 percent of all the destroyed bridges; 3,300 kilometers of tracks; 2,918,000 cubic meters of buildings; and 24 percent of the pumping facilities. Train traffic by 1946 was running regularly on 88 percent of all the railroad lines.

In 1946 the Polish Railroads transported 244.9 million passengers, or 33.7 million more passengers than in the highest prewar year of 1937. Also in 1946 72.8 million tons of freight was transported, or 5.8 million tons more than in 1937.

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During the period of the Three-Year Plan, the railroads transported 334.2 million tons of freight, which was almost as much as that transported by the PKP (Polskie Koleje Panstwowe, Polish State Railroads) from 1932 to 1937 inclusive. During the Three-Year Plan the railroads transported 1,165,200,000 passengers, almost as many as during the 1931-1937 period.

In Poland during the period of the Three-Year Plan freight volume increased 58.5 percent whereas the number of freight cars increased only 11.8 percent.

MAIN OBJECTIVES IN SIX-YEAR PLAN FOR TRANSPORTATION

The Six-Year Plan anticipates 84 percent increase of freight volume and 90.5 percent increase of passenger transportation on standard-gauge tracks. On narrow-gauge tracks freight volume is to increase by 76.5 percent during this period and passenger volume by 45 percent, as compared to 1949.

The following tables give some idea of the increase in freight and passenger operations on Polish railroads.

Freight Volume

<u>Year</u>	<u>Million Tons</u>	<u>Year</u>	<u>Million Tons</u>
1922	42.6	1935	56.2
1923	75.4	1936	57.8
1924	59.96	1937	72.8
1925	58.0	1946	67.0
1926	64.4	1947	88.2
1927	73.4	1948	114.3
1928	80.7	1949	131.7
1929	85.86	1950	150.5
1930	69.5	1951	170
1931	63.9	1952	195 (planned)
1932	48.7	1953	210 (planned)
1933	48.8	1954	230 (planned)
1934	57.8	1955	245 (planned)

Passenger and Freight Volume (per Inhabitant)

<u>Year</u>		<u>Poland</u>
1929	Passengers	5.3
	Tons of freight	2.44
1937	Passengers	6.2
	Tons of freight	2.14

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C-O-N-F-I-D-E-N-T-I-A-LPassenger and Freight Volume (per Inhabitant)

<u>Year</u>		<u>Poland</u>
1949	Passengers	18.4
	Tons of freight	5.44
1950	Passengers	22.6
	Tons of freight	6.03
1955	Passengers	34.13*
	Tons of freight	8.42

*Initial estimate for the Six-Year Plan

Volume of Freight Transports in Thousands of
Ton-Kilometers per One Kilometer of Operating
Railroad Network

<u>Year</u>	<u>Poland</u>
1928	1,274
1937	1,216
1949	1,470
1950	1,580
1955	2,420 (anticipated)

Freight Car Turnaround

Freight car turnaround is a fundamental factor in railroad operations. An analysis of car turnaround time discloses that 51 percent of the time is spent while the car stands at the dispatch station (stacje rozradowe), 22 percent is spent at the mediate stations (posredne stacje techniczne), 11 percent is spent at loading and unloading, and only 16 percent of the time is spent on train runs.

This time factor can be improved upon by decreasing standing time at dispatch stations and at the mediate stations, by decreasing time for loading and unloading, and by decreasing the time of a car trip i.e., increasing the train speeds, eliminating unnecessarily long turnaround transports, and eliminating trips of loose cars.

During the period of the Three-Year Plan the car turnaround time was decreased by 48 hours as compared with November 1946, the month of the highest volume of transports for that year. As compared with 1938, the turnaround time was decreased by 24 hours.

During the Three-Year Plan period the turnaround time of a car, i.e., the time between loads for the same car, was decreased by 0.39 percent. Due to this, the loading index (1946 equals 100) stood at 174.3 in 1949. Parallel with the decreased station layover time and increased train speed, the daily run of a freight car was increased. The daily run of a freight car in 1949 was greater than during the prewar period.

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The improvement of car turnaround time in November 1949 amounted to only 2.5 hours as compared to November 1948. It is expected that the further improvement of the car turnaround time will be increasingly less, although the Six-Year Plan anticipates a reduction of turnaround time by 30 hours.

By 1955 freight transport by rail will reach 242 million tons, or an average daily load of 665,000 tons. The decrease of car turnaround time in the network by one day would be the same as freeing 665,000 tons of goods for production. Since the value of one ton of freight transported by rail on average amounts to 520.98 zlotys, the liberation of 665,000 tons signifies an economic transfer to the national economy of material goods valued at 346,253,700 zlotys.

Uneconomical transports must also be eliminated. For example during the first three quarters of 1950, 587,573 car-hours, or 4,350 car-turnarounds were lost because of forwarding errors. All this space could have been used for transporting other freight. In addition the clients had to pay 8,140,000 zlotys for the reshipped goods and these unnecessary additional trips used up 2,104,526 car-kilometers.

Decreased Time for Loading and Unloading

Although loading and unloading time amounts to only 11 percent of the turnaround time of a car, it is still possible to reduce this time. Time wasted at the loading, unloading, or transloading stops amounted to 10,181,213 car-hours, during the first half of 1950; this is equivalent to a loss of 75,500 cars capable of transporting 1,380,000 tons of freight.

Decreasing the Trip Time of a Train

This can be achieved by working faster on loading and unloading, by decreasing the stop periods and eliminating unnecessary stops of a train, and by increasing the train speed. During the Six-Year Plan Poland anticipates an increase in speed of freight trains by 20 percent. The prewar traffic speed of a train was surpassed in 1949 by 4.3 percent.

Increasing the Number of Cars by Reducing Damage to Cars

The number of cars taken from service for repairs should drop from 18 percent in 1949 to 6 percent in 1955.

Better Utilization of the Loading Capacity of a Car

During 1949, due to the increase of the average car load by 0.1 ton, the Polish railroads transported an additional 755,042 tons of freight on the same rolling stock, and practically without any additional costs. To transport this amount it would have been necessary to use 43,393 cars, or 860 trains with locomotives.

During the Six-Year Plan Poland anticipates an 18 percent increase in the average car load. In order to fulfill this task, the railroads will receive 4-axle freight cars of a larger loading capacity. The total number of 4-axle cars will increase by 150 percent.

Improved Use of Locomotives

During the Six-Year Plan Poland anticipates a considerable improvement in the efficiency of locomotive service. Consequently the plan for 1955 does not anticipate an increase in the total number of locomotives as compared to 1949. At the same time Poland plans to increase the number of "healthy" locomotives by 8.6 percent and the number of operating locomotives by 15.2 percent. The

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increase in freight traffic in 1955 can be accomplished only by increasing the daily run of "healthy" locomotives. For this reason a 22.7 percent increase in the daily run of a locomotive in freight traffic is anticipated.

Railroad Construction

During the Six-Year Plan Poland expects to complete 733 new kilometers of track and to start construction of an additional 210 kilometers of track. During the same period 369 kilometers of single-track lines and 645 kilometers of double-track lines, destroyed during the war, will be rebuilt. In addition 326 kilometers of new double-track will be built on existing lines. During the period of the Six-Year Plan the total length of railroad lines will increase by 4.5 percent. This over-all increase includes a 27.2 percent increase in double-track lines.

From 1918 to 1938, 1,650 kilometers of new railroad lines were built in Poland and 320 kilometers of double-track was added to single-track lines. This means that, on the average, 82.5 kilometers of new lines and 16 kilometers of double-track were built annually during this period. On the other hand, during the Six-Year Plan Poland will construct annually about 122 kilometers of new lines and 54 kilometers of double track, and in addition will annually rebuild about 61.5 kilometers of single-track lines and 107.5 kilometers of double-track lines.

Technical Progress

During the Six-Year Plan mechanization of coal car unloading will increase 35 percent, and the degree of mechanization for loading coal on locomotives will increase 21 percent. The number of locomotives equipped with mechanical fuel stokers will increase by 350 units.

During the Six-Year Plan much progress will be made in standardizing the locomotive rolling stock. In 1949 Poland had 95 types of locomotives. By 1955 the number of types will be reduced to 50 by eliminating the old and uneconomical types and by replacing them with new types of locomotives. In addition long-range plans have been developed for locomotive construction wherein there will be only 6 types for all of PKP. The main parts of the locomotives will be standardized in these types. There will be only 3 types of cylinders, 3 sizes of piston strokes, and 2 types of boiler racks.

During the Six-Year Plan the freight rolling stock will be considerably modernized. Poland will begin large scale construction of large capacity, 4-axle coal cars. The number of these cars will increase by 400 percent. Simultaneously couplings will be strengthened to withstand a 90 ton load and coupling draw hooks to withstand 100 tons, and even 110 tons. This applies to all the new cars and partly to cars now in use.

The use of larger brake cylinders and the increase by 45 percent in the number of cars supplied with a continuous braking, will enable the speed of all freight trains to be increased.

During the Six-Year Plan, all the larger locomotive sheds will be equipped with coal loading and unloading ladle cranes, and with "self-unloading" cars.

Poland anticipates during the Six-Year Plan considerable progress in loading and unloading techniques. Car loading and unloading will be mechanized at 115 stations, both at the general loading tracks and at sidings. Loading and unloading will be mechanized at the stations for coal, gravel, stone, lime, grain, potatoes, artificial fertilizers, long pieces of iron, concrete products,

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ore, wood, gypsum, etc. The above-mentioned stations and sidings will be equipped with loading ramps, self-unloading conveyers, gantry cranes, conveyers with mechanical scoops, masting cranes, mobile cranes, electric cars, fork cars, mechanical shovels, conveyer belts, electric pulleys, etc.

During the Six-Year Plan the length of the rail lines equipped with electromechanical line blocks will increase by 68 percent as compared to 1949. The main lines will be completely equipped with electromechanical line blocks, and the first class lines will be 90 percent equipped.

During the Six-Year Plan Poland plans to construct lines to test automatic block signaling with the signals repeated in the locomotive engineer's cab and connected with automatic braking, or the so-called cab signaling system. By the application of the cab signaling system Poland will attain practically 100 percent traffic safety.

During the Six-Year Plan the stations equipped with station block systems will increase by 31 percent. Thus the total number of stations equipped with station block systems will amount to 77 percent of the total number of stations. This means that all the stations on the main lines and all the branch stations on the first-class lines will be equipped with station block systems.

Poland anticipates during the Six-Year Plan an increase of 36 percent in telecommunications cable lines and of 15 percent in overhead lines. The increase in the number of telephones and the number of switchboards on the railroad system will amount to 35 percent. By the third year of the Plan Poland's rail system telephone network will be equivalent to that of the Swedish railroad system. The number of automatic telephone centers and the telephones will increase considerably.

Narrow-Gauge Railroads

During the Six-Year Plan freight transport on narrow-gauge rail lines will increase 75.5 percent, and passenger transport will increase 44.6 percent; the narrow-gauge railroad network will increase nearly 15 percent, the number of freight cars 75 percent, the number of passenger cars 4 percent, and the number of locomotives 8 percent. In order to fulfill the tasks set for narrow-gauge railroad transportation it is necessary to reduce car turnaround time by 20 percent, increase the number of "healthy" freight cars by 14 percent, increase the number of "healthy" passenger cars by 25.6 percent, and increase the number of "healthy" locomotives by 13.9 percent.

The workers of the narrow-gauge railroad lines should increase the daily run of locomotives by 21 percent, and the speed of trains by 12 percent.

During the Six-Year Plan Poland will construct 300 kilometers of new narrow-gauge lines. Also 34 kilometers of lines will be rebuilt, and 700 kilometers of narrow-gauge lines will be changed to a span of 750 millimeters, which will make it possible to strengthen the road surface and use heavy rolling stock. Apparatus for softening water will be set up at 11 of the narrow-gauge rail stations.

Education

In addition to the engineers and technicians graduated from higher technical schools during the Six-Year Plan, Poland expects to graduate 10,825 railroad workers from 258 first-class vocational courses, and 2,700 railroad workers from 63 second-class vocational courses. During the Six-Year Plan Poland expects to graduate 265 students from two advanced academic courses. The latter would include workers chosen for the engineering profession.

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For the purpose of raising the professional qualifications of all the railroad workers, Poland anticipates that during the Six-Year Plan 2,166 courses will be started, which would affect a total of 97,468 students.

Conclusion

In order to fulfill the transport tasks of the Six-Year Plan the railroad workers should:

1. Decrease the freight car turnaround time, increase the use of car-loading capacities, eliminate duplication in use of cars and excessively short transports, decrease the runs of empty cars, and campaign for regularity of transports.
2. Improve locomotive management by lengthening the daily run of locomotives, and emulate the Soviet "Five Hundreders" locomotive engineers by interrelating the daily run of a locomotive with the increased load and speed of a train.
3. Continuously and consistently campaign to maintain full regularity of schedules.
4. Completely fulfill the investment plans.
5. Utilize assembly work methods, organize the repair of rolling stock by fully utilizing railroad shop machinery, and scrupulously enforce the plan for major repairs of track and equipment in order to insure the safety of train traffic.
6. Develop workers in a more extensive field, i.e., raise their professional qualifications and level of political indoctrination.
7. Widely develop work competition and the rationalizers' movement, and thus increase the regular work output and decrease the real costs of production.

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